



MUSCLE SHOALS
MINERALS INC.

A MEMBER OF THE UCM GROUP OF COMPANIES

510 MULBERRY LANE
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CERTIFICATE OF ANALYSIS

PRODUCT: ZY-7 -25+5u

LOT: 31-1-3

DATE: 01/31/2003

SIEVE ANALYSIS (% Retained)

MICROTRAC (Microns/% Finer)

| | |
|--------------------------|-------|
| 176 | 100.0 |
| 125 | 100.0 |
| 88 | 100.0 |
| 62 | 99.9 |
| 44 | 97.6 |
| 31 | 83.4 |
| 22 | 56.5 |
| 16 | 26.3 |
| 11 | 9.5 |
| 7.8 | 5.5 |
| 5.5 | 3.5 |
| 10% Finer Than (Microns) | 11.1 |
| 50% Finer Than (Microns) | 20.4 |
| 90% Finer Than (Microns) | 35.1 |
| Surface Area | 0.3 |

CHEMICAL ANALYSIS (wt.%)

| | |
|--------------------------------|--------|
| Al ₂ O ₃ | 0.320 |
| SiO ₂ | 0.030 |
| TiO ₂ | 0.050 |
| CaO | 0.100 |
| MgO | 0.020 |
| Fe ₂ O ₃ | 0.070 |
| Y ₂ O ₃ | 7.470 |
| HfO ₂ | 1.820 |
| ZrO ₂ | 90.120 |
| Organic Solids | 0.000 |
| TAO | 0.000 |


QUALITY CONTROL

EXHIBIT 1

BEST AVAILABLE COPY